

Amendments to the Claims:

1. (Previously Presented) A magnetic resonance imaging scanner comprising:

a magnet generating a temporally constant magnetic field;

one or more magnetic field gradient generating structures
5 superimposing selected magnetic field gradients on the temporally constant magnetic field;

a radio frequency shield;

a radio frequency coil disposed inside of the radio frequency shield and selectively producing a radio frequency field; and

10 a magnetic field modifying structure designed to enhance the temporally constant magnetic field, the magnetic field modifying structure being disposed inside of the radio frequency shield and including particles of magnetic material generally smaller in at least one dimension than a skin depth of the radio frequency field in the magnetic material dispersed in an insulating binder.

2. (Previously Presented) The magnetic resonance imaging scanner as set forth in claim 1, wherein the particles of magnetic material dispersed in the binder have a fill factor of at least about 50% by volume.

3. (Previously Presented) The magnetic resonance imaging scanner as set forth in claim 1, wherein the particles of magnetic material are generally smaller in at least one dimension than about one tenth of the skin depth of the radio frequency field in the magnetic material.

4. (Previously Presented) The magnetic resonance imaging scanner as set forth in claim 1, wherein the particles of magnetic material are generally smaller than about 10 microns in at least one dimension.

5. (Previously Presented) The magnetic resonance imaging scanner as set forth in claim 1, wherein the particles of magnetic material are generally smaller than about 4 microns in at least one dimension.

6. (Previously Presented) The magnetic resonance imaging scanner as set forth in claim 1, wherein the particles of magnetic material generally do not have a direction of elongation.

7. (Previously Presented) The magnetic resonance imaging scanner as set forth in claim 1, wherein the particles of magnetic material are generally wire shaped.

8. (Currently Amended) The magnetic resonance imaging scanner as set forth in claim 7, wherein the generally wire shaped particles are oriented with long directions generally transverse to the temporally constant magnetic field and generally parallel to a ~~tangential~~ direction tangential to an annular structure around the
5 temporally constant magnetic field.

9. (Previously Presented) The magnetic resonance imaging scanner as set forth in claim 1, wherein the particles of magnetic material are generally planar.

10. (Previously Presented) The magnetic resonance imaging scanner as set forth in claim 9, wherein the generally planar particles are oriented with plane normals generally parallel to the temporally constant magnetic field.

11. (Previously Presented) The magnetic resonance imaging scanner as set forth in claim 1, wherein the radio frequency coil includes a plurality of parallel rungs, and the particles of magnetic material are disposed at least partially between the rungs.

12. (Previously Presented) The magnetic resonance imaging scanner as set forth in claim 1, wherein the magnetic field modifying structure includes:

5 a plurality of generally annular structures containing particles of magnetic material, the generally annular structures being oriented generally transverse to the temporally constant magnetic field, the annular structures having annular cross sections elongated transverse to the temporally constant magnetic field.

13. (Previously Presented) The magnetic resonance imaging scanner as set forth in claim 1, wherein the magnetic field modifying structure includes:

5 a plurality of magnetic generally annular structures containing particles of magnetic material in the insulating binder, the magnetic generally annular structures being oriented generally transverse to the temporally constant magnetic field, the magnetic annular structures having a longitudinal demagnetization factor parallel to the temporally constant magnetic field and a tangential demagnetization factor in a tangential direction transverse to the temporally constant magnetic field,
10 the longitudinal demagnetization factor being larger than the tangential demagnetization factor to produce tangential flux guiding.

14. (Previously Presented) The magnetic resonance imaging scanner as set forth in claim 1, wherein the magnetic field modifying structure has a longitudinal demagnetization factor parallel to the temporally constant magnetic field and a tangential demagnetization factor in a tangential direction transverse to the
5 temporally constant magnetic field, the longitudinal demagnetization factor being larger than the tangential demagnetization factor to produce tangential flux guiding.

15. (Previously Presented) A magnetic resonance imaging scanner comprising:

a magnet generating a temporally constant magnetic field;

one or more magnetic field gradient generating structures
5 superimposing selected magnetic field gradients on the temporally constant magnetic field;

a radio frequency coil selectively producing a radio frequency field;
and

a magnetic field modifying structure designed to enhance the
10 temporally constant magnetic field, the magnetic field modifying structure having a longitudinal demagnetization factor parallel to the temporally constant magnetic field and a tangential demagnetization factor in a tangential direction transverse to the temporally constant magnetic field, the longitudinal demagnetization factor being larger than the tangential demagnetization factor to produce tangential flux guiding.

16. (Previously Presented) The magnetic resonance imaging scanner as set forth in claim 15, wherein the magnetic field modifying structure includes:

a plurality of generally annular structures oriented generally transverse
5 to the temporally constant magnetic field, the annular structures having annular cross sections elongated transverse to the temporally constant magnetic field.

17. (Previously Presented) The magnetic resonance imaging scanner as set forth in claim 15, wherein the magnetic field modifying structure includes:

ferromagnetic particles that are generally smaller than a skin depth of
5 the radio frequency field in the magnetic material in at least one dimension; and
an insulating binder in which the ferromagnetic particles are dispersed.

18. (Previously Presented) The magnetic resonance imaging scanner as set forth in claim 17, wherein the ferromagnetic particles are dispersed in the binder with a fill factor greater than about 50% by volume.

19. (Previously Presented) The magnetic resonance imaging scanner as set forth in claim 17, wherein the ferromagnetic particles have an

anisotropic particle demagnetization factor with a largest particle demagnetization factor component generally oriented in the direction of the temporally constant magnetic field and a smaller particle demagnetization factor component oriented in a tangential direction transverse to the direction of the temporally constant magnetic field.